

SEQUENCE LISTING

<110> Yamanouchi Pharmaceutical Co., Ltd.

<120> A novel potassium channel protein

<130> Y9903-PCT

<140>

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<150> JP P1998-011434

<151> 1998-01-23

<150> JP P1998-346198

<151> 1998-12-04

<160> 12

<170> PatentIn Ver. 2.0

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<211> 3323

<212> DNA

<213> Homo sapiens

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<221> CDS

<222> (6)..(3257)

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Gly Phe Cys Asp Leu Thr Gly Phe Ser Arg Ala Glu Val Met Gln Arg
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Glu Leu Ile Leu Tyr Arg Lys Ser Gly Leu Pro Phe Trp Cys Leu Leu	
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Asp Val Ile Pro Ile Lys Asn Glu Lys Gly Glu Val Ala Leu Phe Leu	
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gtc tct cac aag gac atc agc gaa acc aag aac cga ggg ggc ccc gac	434
Val Ser His Lys Asp Ile Ser Glu Thr Lys Asn Arg Gly Gly Pro Asp	
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Arg Trp Lys Glu Thr Gly Gly Gly Arg Arg Arg Tyr Gly Arg Ala Arg	
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tcc aaa ggc ttc aat gcc aac cgg cgg cgg agc cgg gcc gtg ctc tac	530
Ser Lys Gly Phe Asn Ala Asn Arg Arg Arg Ser Arg Ala Val Leu Tyr	
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His Leu Ser Gly His Leu Gln Lys Gln Pro Lys Gly Lys His Lys Leu	
180 185 190	
aat aag ggg gtg ttt ggg gag aaa cca aac ttg cct gag tac aaa gta	626
Asn Lys Gly Val Phe Gly Glu Lys Pro Asn Leu Pro Glu Tyr Lys Val	
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Ala Ala Ile Arg Lys Ser Pro Phe Ile Leu Leu His Cys Gly Ala Leu	
210 215 220	
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Arg Ala Thr Trp Asp Gly Phe Ile Leu Leu Ala Thr Leu Tyr Val Ala	
225 230 235	
gtc act gtg ccc tac agc gtg tgt gtg agc aca gca cgg gag ccc agt	770
Val Thr Val Pro Tyr Ser Val Cys Val Ser Thr Ala Arg Glu Pro Ser	
240 245 250 255	
gcc gcc cgc ggc ccg ccc agc gtc tgt gac ctg gcc gtg gag gtc ctc	818

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Ala Ala Arg Gly Pro Pro Ser Val Cys Asp Leu Ala Val Glu Val Leu	
260 265 270	
ttc atc ctt gac att gtg ctg aat ttc cgt acc aca ttc gtg tcc aag	866
Phe Ile Leu Asp Ile Val Leu Asn Phe Arg Thr Thr Phe Val Ser Lys	
275 280 285	
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Ser Gly Gln Val Val Phe Ala Pro Lys Ser Ile Cys Leu His Tyr Val	
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Thr Thr Trp Phe Leu Leu Asp Val Ile Ala Ala Leu Pro Phe Asp Leu	
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Arg Glu Ile Glu Ser Ser Glu Ser Glu Leu Pro Glu Ile Gly Trp Leu	
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Gln Glu Leu Ala Arg Arg Leu Glu Thr Pro Tyr Tyr Leu Val Gly Arg	
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Leu Arg Ser Ala Tyr Ile Thr Ser Leu Tyr Phe Ala Leu Ser Ser Leu	
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Thr Ser Val Gly Phe Gly Asn Val Ser Ala Asn Thr Asp Thr Glu Lys	
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Ile Phe Ser Ile Cys Thr Met Leu Ile Gly Ala Leu Met His Ala Val	
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Ser Leu Pro Asp Glu Leu Arg Ala Asp Ile Ala Met His Leu His Lys	
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Glu Val Leu Gln Leu Pro Leu Phe Glu Ala Ala Ser Arg Gly Cys Leu	
580 585 590	
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Arg Ala Leu Ser Leu Ala Leu Arg Pro Ala Phe Cys Thr Pro Gly Glu	
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Tyr Leu Ile His Gln Gly Asp Ala Leu Gln Ala Leu Tyr Phe Val Cys	
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Ser Gly Ser Met Glu Val Leu Lys Gly Gly Thr Val Leu Ala Ile Leu	
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865 870 875	
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Lys Leu Arg Gln Ala Val Thr Glu Leu Ser Glu Gln Val Leu Gln Met	
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Arg Glu Gly Leu Gln Ser Leu Arg Gln Ala Val Gln Leu Val Leu Ala	
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ccc cac agg gag ggt ccg tgc cct cgg gca tcg gga gag ggg ccg tgc	2786
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Ala Ser Ser Tyr Cys Leu Gln Pro Pro Ala Gly Ser Val Leu Ser Gly	
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Thr Trp Pro His Pro Arg Pro Gly Pro Pro Pro Leu Met Ala Pro Trp	
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Ala Phe Trp Thr Ser Thr Ser Asp Ser Glu Pro Pro Ala Ser Gly Asp	
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ctc tgc tct gag ccc agc acc cct gcc tcc cct cct cct tct gag gaa	3074
Leu Cys Ser Glu Pro Ser Thr Pro Ala Ser Pro Pro Pro Ser Glu Glu	
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Gly Ala Arg Thr Gly Pro Ala Glu Pro Val Ser Gln Ala Glu Ala Thr
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agc act gga gag ccc cca cca ggg tca ggg ggc ctg gcc ttg ccc tgg 3170
Ser Thr Gly Glu Pro Pro Gly Ser Gly Gly Leu Ala Leu Pro Trp
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gac ccc cac agc ctg gag atg gtg ctt att ggc tgc cat ggc tct ggc 3218
Asp Pro His Ser Leu Glu Met Val Leu Ile Gly Cys His Gly Ser Gly
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aca gtc cag tgg acc cag gaa gaa ggc aca ggg gtc tga gtaccagccc 3267
Thr Val Gln Trp Thr Gln Glu Glu Gly Thr Gly Val
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Cys Ala Cys Ser Phe Leu Tyr Gly Pro Asp Thr Ser Glu Leu Val Arg
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Gln Gln Ile Arg Lys Ala Leu Asp Glu His Lys Glu Phe Lys Ala Glu
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Leu Ile Leu Tyr Arg Lys Ser Gly Leu Pro Phe Trp Cys Leu Leu Asp
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Val Ile Pro Ile Lys Asn Glu Lys Gly Glu Val Ala Leu Phe Leu Val
115 120 125

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Ser His Lys Asp Ile Ser Glu Thr Lys Asn Arg Gly Gly Pro Asp Arg
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Trp Lys Glu Thr Gly Gly Gly Arg Arg Arg Tyr Gly Arg Ala Arg Ser
145 150 155 160

Lys Gly Phe Asn Ala Asn Arg Arg Arg Ser Arg Ala Val Leu Tyr His
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Leu Ser Gly His Leu Gln Lys Gln Pro Lys Gly Lys His Lys Leu Asn
180 185 190

Lys Gly Val Phe Gly Glu Lys Pro Asn Leu Pro Glu Tyr Lys Val Ala
195 200 205

Ala Ile Arg Lys Ser Pro Phe Ile Leu Leu His Cys Gly Ala Leu Arg
210 215 220

Ala Thr Trp Asp Gly Phe Ile Leu Leu Ala Thr Leu Tyr Val Ala Val
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245 250 255

Ala Arg Gly Pro Pro Ser Val Cys Asp Leu Ala Val Glu Val Leu Phe
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Ile Leu Asp Ile Val Leu Asn Phe Arg Thr Thr Phe Val Ser Lys Ser
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Gly Gln Val Val Phe Ala Pro Lys Ser Ile Cys Leu His Tyr Val Thr
290 295 300

Thr Trp Phe Leu Leu Asp Val Ile Ala Ala Leu Pro Phe Asp Leu Leu
305 310 315 320

His Ala Phe Lys Val Asn Val Tyr Phe Gly Ala His Leu Leu Lys Thr
325 330 335

Val Arg Leu Leu Arg Leu Leu Arg Leu Leu Pro Arg Leu Asp Arg Tyr
340 345 350

Ser Gln Tyr Ser Ala Val Val Leu Thr Leu Leu Met Ala Val Phe Ala
355 360 365

Leu Leu Ala His Trp Val Ala Cys Val Trp Phe Tyr Ile Gly Gln Arg
370 375 380

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Glu Ile Glu Ser Ser Glu Ser Glu Leu Pro Glu Ile Gly Trp Leu Gln
385 390 395 400

Glu Leu Ala Arg Arg Leu Glu Thr Pro Tyr Tyr Leu Val Gly Arg Arg
405 410 415

Pro Ala Gly Gly Asn Ser Ser Gly Gln Ser Asp Asn Cys Ser Ser Ser
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Ser Glu Ala Asn Gly Thr Gly Leu Glu Leu Leu Gly Gly Pro Ser Leu
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Arg Ser Ala Tyr Ile Thr Ser Leu Tyr Phe Ala Leu Ser Ser Leu Thr
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Thr Trp Ala Val Asn Asn Gly Ile Asp Thr Thr Glu Leu Leu Gln Ser
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Leu Pro Asp Glu Leu Arg Ala Asp Ile Ala Met His Leu His Lys Glu
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Val Leu Gln Leu Pro Leu Phe Glu Ala Ala Ser Arg Gly Cys Leu Arg
580 585 590

Ala Leu Ser Leu Ala Leu Arg Pro Ala Phe Cys Thr Pro Gly Glu Tyr
595 600 605

Leu Ile His Gln Gly Asp Ala Leu Gln Ala Leu Tyr Phe Val Cys Ser
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Gly Ser Met Glu Val Leu Lys Gly Gly Thr Val Leu Ala Ile Leu Gly
625 630 635 640

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Lys Gly Asp Leu Ile Gly Cys Glu Leu Pro Arg Arg Glu Gln Val Val
645 650 655

Lys Ala Asn Ala Asp Val Lys Gly Leu Thr Tyr Cys Val Leu Gln Cys
660 665 670

Leu Gln Leu Ala Gly Leu His Asp Ser Leu Ala Leu Tyr Pro Glu Phe
675 680 685

Ala Pro Arg Phe Ser Arg Gly Leu Arg Gly Glu Leu Ser Tyr Asn Leu
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Asp Asn Thr Leu Met Ser Thr Leu Glu Glu Lys Glu Thr Asp Gly Glu
725 730 735

Gln Gly Pro Thr Val Ser Pro Ala Pro Ala Asp Glu Pro Ser Ser Pro
740 745 750

Leu Leu Ser Pro Gly Cys Thr Ser Ser Ser Ser Ala Ala Lys Leu Leu
755 760 765

Ser Pro Arg Arg Thr Ala Pro Arg Pro Arg Leu Gly Gly Arg Gly Arg
770 775 780

Pro Gly Arg Ala Gly Ala Leu Lys Ala Glu Ala Gly Pro Ser Ala Pro
785 790 795 800

Pro Arg Ala Leu Glu Gly Leu Arg Leu Pro Pro Met Pro Trp Asn Val
805 810 815

Pro Pro Asp Leu Ser Pro Arg Val Val Asp Gly Ile Glu Asp Gly Cys
820 825 830

Gly Ser Asp Gln Pro Lys Phe Ser Phe Arg Val Gly Gln Ser Gly Pro
835 840 845

Glu Cys Ser Ser Ser Pro Ser Pro Gly Pro Glu Ser Gly Leu Leu Thr
850 855 860

Val Pro His Gly Pro Ser Glu Ala Arg Asn Thr Asp Thr Leu Asp Lys
865 870 875 880

Leu Arg Gln Ala Val Thr Glu Leu Ser Glu Gln Val Leu Gln Met Arg
885 890 895

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Glu Gly Leu Gln Ser Leu Arg Gln Ala Val Gln Leu Val Leu Ala Pro
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His Arg Glu Gly Pro Cys Pro Arg Ala Ser Gly Glu Gly Pro Cys Pro
915 920 925

Ala Ser Thr Ser Gly Leu Leu Gln Pro Leu Cys Val Asp Thr Gly Ala
930 935 940

Ser Ser Tyr Cys Leu Gln Pro Pro Ala Gly Ser Val Leu Ser Gly Thr
945 950 955 960

Trp Pro His Pro Arg Pro Gly Pro Pro Pro Leu Met Ala Pro Trp Pro
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Trp Gly Pro Pro Ala Ser Gln Ser Ser Pro Trp Pro Arg Ala Thr Ala
980 985 990

Phe Trp Thr Ser Thr Ser Asp Ser Glu Pro Pro Ala Ser Gly Asp Leu
995 1000 1005

Cys Ser Glu Pro Ser Thr Pro Ala Ser Pro Pro Pro Ser Glu Glu Gly
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Ala Arg Thr Gly Pro Ala Glu Pro Val Ser Gln Ala Glu Ala Thr Ser
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Thr Gly Glu Pro Pro Pro Gly Ser Gly Gly Leu Ala Leu Pro Trp Asp
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Pro His Ser Leu Glu Met Val Leu Ile Gly Cys His Gly Ser Gly Thr
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gac acc atc gcc acc cgt ttt gac gga acg cac agc aac ttc ctg ctg 96
Asp Thr Ile Ala Thr Arg Phe Asp Gly Thr His Ser Asn Phe Leu Leu
20 25 30
gcc aac gca cag ggc aca cgg ggc ttt ccc atc gtc tac tgc tcc gac 144
Ala Asn Ala Gln Gly Thr Arg Gly Phe Pro Ile Val Tyr Cys Ser Asp
35 40 45
ggc ttc tgc gag ctc aca ggc tac ggt cgc acc gag gtc atg cag aag 192
Gly Phe Cys Glu Leu Thr Gly Tyr Gly Arg Thr Glu Val Met Gln Lys
50 55 60
acc tgc agc tgc cgt ttc ctc tac ggc cca gag acc agt gag cca gcc 240
Thr Cys Ser Cys Arg Phe Leu Tyr Gly Pro Glu Thr Ser Glu Pro Ala
65 70 75
ctg cag cgt ctg cac aaa gcc ctg gag ggc cac cag gag cac cgg gct 288
Leu Gln Arg Leu His Lys Ala Leu Glu Gly His Gln Glu His Arg Ala
80 85 90 95
gaa atc tgc ttc tac cgc aag gat ggc tca gcc ttt tgg tgc ctc ctg 336

Glu Ile Cys Phe Tyr Arg Lys Asp Gly Ser Ala Phe Trp Cys Leu Leu	
100	105 110
gac atg atg ccc atc aag aat gag atg ggg gag gtc gtg ctg ttc ctc	384
Asp Met Met Pro Ile Lys Asn Glu Met Gly Glu Val Val Leu Phe Leu	
115	120 125
ttt tcc ttc aag gat atc act cag agt gga agc cca gga ctt ggc ccc	432
Phe Ser Phe Lys Asp Ile Thr Gln Ser Gly Ser Pro Gly Leu Gly Pro	
130	135 140
caa gga ggc cgc ggg gac agt aat cac gaa aac tcc ctt ggt aga agg	480
Gln Gly Gly Arg Gly Asp Ser Asn His Glu Asn Ser Leu Gly Arg Arg	
145	150 155
gga gcc acc tgg aaa ttt cgg tct gcc aga aga cgg agc cgt act gtc	528
Gly Ala Thr Trp Lys Phe Arg Ser Ala Arg Arg Arg Ser Arg Thr Val	
160	165 170 175
cta cac cga ctg acc ggc cac ttt ggc cgc cgg ggc cag gga ggc atg	576
Leu His Arg Leu Thr Gly His Phe Gly Arg Arg Gly Gln Gly Gly Met	
180	185 190
aag gcc aat aat aac gtg ttt gag cca aag cca tca gtg ccc gag tac	624
Lys Ala Asn Asn Asn Val Phe Glu Pro Lys Pro Ser Val Pro Glu Tyr	
195	200 205
aag gtg gcc tcc gtg ggg ggg tct cgc tgc ctc ctc ctc cac tac agc	672
Lys Val Ala Ser Val Gly Gly Ser Arg Cys Leu Leu Leu His Tyr Ser	
210	215 220
gtc tcc aag gcc atc tgg gac ggc ctt atc ctc ctt gcc acc ttc tac	720
Val Ser Lys Ala Ile Trp Asp Gly Leu Ile Leu Leu Ala Thr Phe Tyr	
225	230 235
gtt gcg gtc acc gtc ccc tac aat gtc tgt ttc tcg ggt gac gat gac	768
Val Ala Val Thr Val Pro Tyr Asn Val Cys Phe Ser Gly Asp Asp Asp	
240	245 250 255
acc ccc atc act tcg cga cac acc ctt gtc agc gac atc gcc gtg gaa	816
Thr Pro Ile Thr Ser Arg His Thr Leu Val Ser Asp Ile Ala Val Glu	
260	265 270
atg ctc ttc atc cta gat atc atc ctg aac ttc cgc acc acc tat gtg	864
Met Leu Phe Ile Leu Asp Ile Ile Leu Asn Phe Arg Thr Thr Tyr Val	
275	280 285
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Ser Gln Ser Gly Gln Val Ile Ser Ala Pro Arg Ser Ile Gly Leu His	
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Glu Arg Tyr Ser Gln Cys Ser Ala Val Val Leu Thr Leu Leu Met Ser	
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Val Phe Ala Leu Leu Ala His Trp Met Ala Cys Ile Trp Tyr Val Ile	
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Gly Arg Arg Glu Met Glu Ala Asn Asp Pro Leu Leu Trp Asp Ile Gly	
385 390 395	
tgg ttg cat gag ttg ggc aag cgt ctg gag gtg ccc tat gtc aat ggc	1248
Trp Leu His Glu Leu Gly Lys Arg Leu Glu Val Pro Tyr Val Asn Gly	
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Ser Val Gly Gly Pro Ser Arg Arg Ser Ala Tyr Ile Ala Ala Leu Tyr	
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Phe Thr Leu Ser Ser Leu Thr Ser Val Gly Phe Gly Asn Val Cys Ala	
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Asn Thr Asp Ala Glu Lys Ile Phe Ser Ile Cys Thr Met Leu Ile Gly	
450 455 460	
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Ala Leu Met His Ala Val Val Phe Gly Asn Val Thr Ala Ile Ile Gln	
465 470 475	
cgc atg tac tcg cgc cgc tcg ctc tac cac agc cgc atg aag gac ctc	1488

Arg Met Tyr Ser Arg Arg Ser Leu Tyr His Ser Arg Met Lys Asp Leu	
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aag gac ttc atc cgt gtg cac cgc ctg ccg cgg ccg ctc aag cag cgc	1536
Lys Asp Phe Ile Arg Val His Arg Leu Pro Arg Pro Leu Lys Gln Arg	
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gcc aac gag tta ctg cgt gac ttc cca gac gag ctg aga gct gac att	1632
Ala Asn Glu Leu Leu Arg Asp Phe Pro Asp Glu Leu Arg Ala Asp Ile	
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gct atg cac ctg aat cgg gag atc ctg cag ctg ccg ttg ttc ggg gca	1680
Ala Met His Leu Asn Arg Glu Ile Leu Gln Leu Pro Leu Phe Gly Ala	
545	550 555
gcg agc agg ggc tgc ctg cgg gcc cta tcg ctg cac atc aag acc tcg	1728
Ala Ser Arg Gly Cys Leu Arg Ala Leu Ser Leu His Ile Lys Thr Ser	
560	565 570 575
ttc tgc gct ccg ggc gag tac ctg ttg cgc cgt ggg gat gcc ctg cag	1776
Phe Cys Ala Pro Gly Glu Tyr Leu Leu Arg Arg Gly Asp Ala Leu Gln	
580	585 590
gca cat tac tat gtc tgc tcc ggc tcg ctt gag gtg ctc cga gac aac	1824
Ala His Tyr Tyr Val Cys Ser Gly Ser Leu Glu Val Leu Arg Asp Asn	
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atg gtg ctg gcc atc ctg ggg aag ggg gac ctg att gga gca gat atc	1872
Met Val Leu Ala Ile Leu Gly Lys Gly Asp Leu Ile Gly Ala Asp Ile	
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cct gag ccg ggg cag gag cct ggg ttg gga gca gac cca aac ttc gtg	1920
Pro Glu Pro Gly Gln Glu Pro Gly Leu Gly Ala Asp Pro Asn Phe Val	
625	630 635
cta aag acc agt gct gat gtg aaa gct ctg acc tac tgt ggc ctg cag	1968
Leu Lys Thr Ser Ala Asp Val Lys Ala Leu Thr Tyr Cys Gly Leu Gln	
640	645 650 655
cag ctg agc agc cga ggg ctg gct gag gtc ctg agg ctc tat cct gag	2016
Gln Leu Ser Ser Arg Gly Leu Ala Glu Val Leu Arg Leu Tyr Pro Glu	
660	665 670
tat ggg gct gcc ttc cgg gct ggc ctg ccc cgg gac ctc acc ttc aac	2064

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Tyr Gly Ala Ala Phe Arg Ala Gly Leu Pro Arg Asp Leu Thr Phe Asn	
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ctg cgc cag ggc tct gac acc agt ggc ctc agc cgc ttt tcc cga tcc	2112
Leu Arg Gln Gly Ser Asp Thr Ser Gly Leu Ser Arg Phe Ser Arg Ser	
690 695 700	
cct cgc ctc tcc cag ccc cgc tca gaa agc ctc ggc tcc tcc tca gac	2160
Pro Arg Leu Ser Gln Pro Arg Ser Glu Ser Leu Gly Ser Ser Ser Asp	
705 710 715	
aag acg ctg cca tcc atc aca gag gcc gag agt ggc gcg gag cct ggg	2208
Lys Thr Leu Pro Ser Ile Thr Glu Ala Glu Ser Gly Ala Glu Pro Gly	
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ggg ggt ccc agg ccc cga cgg ccc ctc ctg ctg ccc aac ctc agc cca	2256
Gly Gly Pro Arg Pro Arg Arg Pro Leu Leu Leu Pro Asn Leu Ser Pro	
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Ala Arg Pro Arg Gly Ser Leu Val Ser Leu Leu Gly Glu Glu Leu Pro	
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cca ttc tca gcc ctt gtc tcc tct cct tcc tta tcc cca tcc ctg tcc	2352
Pro Phe Ser Ala Leu Val Ser Ser Pro Ser Leu Ser Pro Ser Leu Ser	
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Pro Ala Leu Ala Gly Gln Gly His Ser Ala Ser Pro His Gly Pro Pro	
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Arg Cys Ser Ala Ala Trp Lys Pro Pro Gln Leu Leu Ile Pro Pro Leu	
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Gly Thr Phe Gly Pro Pro Asp Leu Ser Pro Arg Ile Val Asp Gly Ile	
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Glu Asp Ser Gly Ser Thr Ala Glu Ala Pro Ser Phe Arg Phe Ser Arg	
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Arg Pro Glu Leu Pro Arg Pro Arg Ser Gln Ala Pro Pro Thr Gly Thr	
850 855 860	
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Arg	Pro	Ser	Pro	Glu	Leu	Ala	Ser	Glu	Ala	Glu	Glu	Val	Lys	Glu	Lys	
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Val	Cys	Arg	Leu	Asn	Gln	Glu	Ile	Ser	Arg	Leu	Asn	Gln	Glu	Val	Ser	
880				885						890				895		
cag	ctt	agc	cgg	gag	ctg	cgg	cac	atc	atg	ggc	ctg	ctg	cag	gcc	agg	2736
Gln	Leu	Ser	Arg	Glu	Leu	Arg	His	Ile	Met	Gly	Leu	Leu	Gln	Ala	Arg	
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ctg	ggt	ccc	cca	ggc	cac	cca	gca	ggc	tcc	gct	tgg	acc	cca	gac	cct	2784
Leu	Gly	Pro	Pro	Gly	His	Pro	Ala	Gly	Ser	Ala	Trp	Thr	Pro	Asp	Pro	
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Ala	Ser	Val	Gly	Thr	Met	Glu	Thr	Gly	Thr	Ala	Leu	Leu	Asp	Leu	Arg	
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Pro	Ser	Ile	Leu	Pro	Pro	Tyr	Pro	Ser	Glu	Pro	Asp	Pro	Leu	Gly	Pro	
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Ser	Pro	Val	Pro	Glu	Ala	Ser	Pro	Pro	Thr	Pro	Ser	Leu	Leu	Arg	His	
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agt	ttc	cag	tcc	agg	tca	gac	aca	ttc	cac	tga	ccctggc					3064
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<212> PRT

<213> Homo sapiens

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Asn Ala Gln Gly Thr Arg Gly Phe Pro Ile Val Tyr Cys Ser Asp Gly
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Phe Cys Glu Leu Thr Gly Tyr Gly Arg Thr Glu Val Met Gln Lys Thr
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Cys Ser Cys Arg Phe Leu Tyr Gly Pro Glu Thr Ser Glu Pro Ala Leu
65 70 75 80

Gln Arg Leu His Lys Ala Leu Glu Gly His Gln Glu His Arg Ala Glu
85 90 95

Ile Cys Phe Tyr Arg Lys Asp Gly Ser Ala Phe Trp Cys Leu Leu Asp
100 105 110

Met Met Pro Ile Lys Asn Glu Met Gly Glu Val Val Leu Phe Leu Phe
115 120 125

Ser Phe Lys Asp Ile Thr Gln Ser Gly Ser Pro Gly Leu Gly Pro Gln
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Gly Gly Arg Gly Asp Ser Asn His Glu Asn Ser Leu Gly Arg Arg Gly
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Ala Thr Trp Lys Phe Arg Ser Ala Arg Arg Arg Ser Arg Thr Val Leu
165 170 175

His Arg Leu Thr Gly His Phe Gly Arg Arg Gly Gln Gly Gly Met Lys
180 185 190

Ala Asn Asn Asn Val Phe Glu Pro Lys Pro Ser Val Pro Glu Tyr Lys
195 200 205

Val Ala Ser Val Gly Gly Ser Arg Cys Leu Leu Leu His Tyr Ser Val
210 215 220

Ser Lys Ala Ile Trp Asp Gly Leu Ile Leu Leu Ala Thr Phe Tyr Val
225 230 235 240

Ala Val Thr Val Pro Tyr Asn Val Cys Phe Ser Gly Asp Asp Asp Thr
245 250 255

Pro Ile Thr Ser Arg His Thr Leu Val Ser Asp Ile Ala Val Glu Met
260 265 270

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Leu Phe Ile Leu Asp Ile Ile Leu Asn Phe Arg Thr Thr Tyr Val Ser
275 280 285

Gln Ser Gly Gln Val Ile Ser Ala Pro Arg Ser Ile Gly Leu His Tyr
290 295 300

Leu Ala Thr Trp Phe Phe Ile Asp Leu Ile Ala Ala Leu Pro Phe Asp
305 310 315 320

Leu Leu Tyr Ile Phe Asn Ile Thr Val Thr Ser Leu Val His Leu Leu
325 330 335

Lys Thr Val Arg Leu Leu Arg Leu Leu Arg Leu Leu Gln Lys Leu Glu
340 345 350

Arg Tyr Ser Gln Cys Ser Ala Val Val Leu Thr Leu Leu Met Ser Val
355 360 365

Phe Ala Leu Leu Ala His Trp Met Ala Cys Ile Trp Tyr Val Ile Gly
370 375 380

Arg Arg Glu Met Glu Ala Asn Asp Pro Leu Leu Trp Asp Ile Gly Trp
385 390 395 400

Leu His Glu Leu Gly Lys Arg Leu Glu Val Pro Tyr Val Asn Gly Ser
405 410 415

Val Gly Gly Pro Ser Arg Arg Ser Ala Tyr Ile Ala Ala Leu Tyr Phe
420 425 430

Thr Leu Ser Ser Leu Thr Ser Val Gly Phe Gly Asn Val Cys Ala Asn
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Thr Asp Ala Glu Lys Ile Phe Ser Ile Cys Thr Met Leu Ile Gly Ala
450 455 460

Leu Met His Ala Val Val Phe Gly Asn Val Thr Ala Ile Ile Gln Arg
465 470 475 480

Met Tyr Ser Arg Arg Ser Leu Tyr His Ser Arg Met Lys Asp Leu Lys
485 490 495

Asp Phe Ile Arg Val His Arg Leu Pro Arg Pro Leu Lys Gln Arg Met
500 505 510

Leu Glu Tyr Phe Gln Thr Thr Trp Ala Val Asn Ser Gly Ile Asp Ala
515 520 525

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Asn Glu Leu Leu Arg Asp Phe Pro Asp Glu Leu Arg Ala Asp Ile Ala
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Met His Leu Asn Arg Glu Ile Leu Gln Leu Pro Leu Phe Gly Ala Ala
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Ser Arg Gly Cys Leu Arg Ala Leu Ser Leu His Ile Lys Thr Ser Phe
565 570 575

Cys Ala Pro Gly Glu Tyr Leu Leu Arg Arg Gly Asp Ala Leu Gln Ala
580 585 590

His Tyr Tyr Val Cys Ser Gly Ser Leu Glu Val Leu Arg Asp Asn Met
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Val Leu Ala Ile Leu Gly Lys Gly Asp Leu Ile Gly Ala Asp Ile Pro
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Glu Pro Gly Gln Glu Pro Gly Leu Gly Ala Asp Pro Asn Phe Val Leu
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Lys Thr Ser Ala Asp Val Lys Ala Leu Thr Tyr Cys Gly Leu Gln Gln
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Leu Ser Ser Arg Gly Leu Ala Glu Val Leu Arg Leu Tyr Pro Glu Tyr
660 665 670

Gly Ala Ala Phe Arg Ala Gly Leu Pro Arg Asp Leu Thr Phe Asn Leu
675 680 685

Arg Gln Gly Ser Asp Thr Ser Gly Leu Ser Arg Phe Ser Arg Ser Pro
690 695 700

Arg Leu Ser Gln Pro Arg Ser Glu Ser Leu Gly Ser Ser Ser Asp Lys
705 710 715 720

Thr Leu Pro Ser Ile Thr Glu Ala Glu Ser Gly Ala Glu Pro Gly Gly
725 730 735

Gly Pro Arg Pro Arg Arg Pro Leu Leu Leu Pro Asn Leu Ser Pro Ala
740 745 750

Arg Pro Arg Gly Ser Leu Val Ser Leu Leu Gly Glu Glu Leu Pro Pro
755 760 765

Phe Ser Ala Leu Val Ser Ser Pro Ser Leu Ser Pro Ser Leu Ser Pro
770 775 780

Ala Leu Ala Gly Gln Gly His Ser Ala Ser Pro His Gly Pro Pro Arg
785 790 795 800

Cys Ser Ala Ala Trp Lys Pro Pro Gln Leu Leu Ile Pro Pro Leu Gly
805 810 815

Thr Phe Gly Pro Pro Asp Leu Ser Pro Arg Ile Val Asp Gly Ile Glu
820 825 830

Asp Ser Gly Ser Thr Ala Glu Ala Pro Ser Phe Arg Phe Ser Arg Arg
835 840 845

Pro Glu Leu Pro Arg Pro Arg Ser Gln Ala Pro Pro Thr Gly Thr Arg
850 855 860

Pro Ser Pro Glu Leu Ala Ser Glu Ala Glu Glu Val Lys Glu Lys Val
865 870 875 880

Cys Arg Leu Asn Gln Glu Ile Ser Arg Leu Asn Gln Glu Val Ser Gln
885 890 895

Leu Ser Arg Glu Leu Arg His Ile Met Gly Leu Leu Gln Ala Arg Leu
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Gly Pro Pro Gly His Pro Ala Gly Ser Ala Trp Thr Pro Asp Pro Pro
915 920 925

Cys Pro Gln Leu Arg Pro Pro Cys Leu Ser Pro Cys Ala Ser Arg Pro
930 935 940

Pro Pro Ser Leu Gln Asp Thr Thr Leu Ala Glu Val His Cys Pro Ala
945 950 955 960

Ser Val Gly Thr Met Glu Thr Gly Thr Ala Leu Leu Asp Leu Arg Pro
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Ser Ile Leu Pro Pro Tyr Pro Ser Glu Pro Asp Pro Leu Gly Pro Ser
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